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☐ 1. Document ID: US 20040105016 A1

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L1: Entry 1 of 59 File: PGPB Jun 3, 2004

PGPUB-DOCUMENT-NUMBER: 20040105016
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20040105016 A1

TITLE: Image processing circuit of image input device

PUBLICATION-DATE: June 3, 2004

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Sasaki, Gen	Osaka		JP	

US-CL-CURRENT: 348/222.1; 386/117

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Ima

☑ 2. Document ID: US 20040103101 A1

L1: Entry 2 of 59 File: PGPB May 27, 2004

DOCUMENT-IDENTIFIER: US 20040103101 A1
TITLE: Method and system for detecting a geometrically transformed copy of an image

Detail Description Paragraph:
[0075] More complex models may be created to accommodate gamma correction, but dynamic range clipping in these transformations may complicate the solution. An alternative is to simply build a look up table that maps pixel values between the corresponding objects of the two pixels. Interpolation and extrapolation techniques can be employed to determine correspondences not populated within the look up table. The determined luminance transformation is applied to the first image (step 650), and a difference image is created by subtracting the images (step 660). Applying a threshold to the absolute value of the difference image creates a binary map of similar pixels (step 670). This map can be cleaned up and simplified by applying morphological operations, or by region merging and filling via connected component analysis (step 680). The resulting map describes the regions of similarity between the two images. Details on various morphological operations and connected component techniques can be found in Gonzalez, R. and Woods, R., "Digital Image Processing," Addison-Wesley, 1992, pages 518-548.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Ima

☐ 3. Document ID: US 20040095482 A1

L1: Entry 3 of 59 File: PGPB May 20, 2004

DOCUMENT-IDENTIFIER: US 20040095482 A1
TITLE: Image processing circuit of image input device

Detail Description Paragraph:
[0178] When such a gamma compensation processing is performed at the step prior to the mentioned pixel interpolation processing, only a single input port and a single output port may be provided. A selector (not shown) may be provided to the input port and output port, so that the selector splits data into four colors, so as to be inputted/outputted to four look-up tables 78a to 78d. Here again, the structure of the look-up table 78 (78a to 78d) in itself is the same as that shown in FIGS. 17 and 18.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Ima

☐ 4. Document ID: US 20040085462 A1

L1: Entry 4 of 59 File: PGPB May 6, 2004

DOCUMENT-IDENTIFIER: US 20040085462 A1
TITLE: Image processing circuit of image input device

Detail Description Paragraph:
[0174] When such a gamma compensation processing is performed at the step prior to the mentioned pixel interpolation processing, only a single input port and a single output port may be provided. A selector (not shown) may be provided to the input port and output port, so that the selector splits data into four colors, so as to be inputted/outputted to four look-up tables 78a to 78d. Here again, the structure of the look-up table 78 (78a to 78d) in itself is the same as that shown in FIGS. 17 and 18.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Ima

☐ 5. Document ID: US 20040027548 A1

L1: Entry 5 of 59 File: PGPB Feb 12, 2004

DOCUMENT-IDENTIFIER: US 20040027548 A1
TITLE: Thermal development apparatus and image recording apparatus

Detail Description Paragraph:
[0068] In the laser scanning apparatus 4, the image data is converted to density value data based on a .gamma.-Look Up Table, whereby the image data is converted to density data (Step S4). After that, the laser scanning apparatus subjects the converted density value data to image enlargement/interpolation processing and forms the density value data, that is actually to be used for exposing the film F, by interpolating the density value in the necessary area (Step S5).

6. Document ID: US 20040012800 A1

L1: Entry 6 of 59 File: PGPB Jan 22, 2004

DOCUMENT-IDENTIFIER: US 20040012800 A1
TITLE: Image forming apparatus and image forming method

CLAIMS:

9. An image forming method according to claim 6, wherein the second generating step performs interpolation processing according to a plurality of gradation numbers for the density deviation determined in the calculating step, determining a ratio of reflectivity deviation from the density deviation in which the interpolation processing is performed, determines a conversion curve of scanner reflectivity from the ratio of reflectivity deviation, and generates a newly second gamma correction table from the conversion curve of scanner reflectivity.

7. Document ID: US 20030231366 A1

L1: Entry 7 of 59 File: PGPB Dec 18, 2003

DOCUMENT-IDENTIFIER: US 20030231366 A1
TITLE: Method for constructing a Gamma table to perform Gamma correction according to the Gamma table

Abstract Paragraph:
A method for constructing a Gamma table to perform Gamma correction according to the Gamma table. First, select (2.sup.M+1) major sampling pixel data, which divide a Gamma curve into 2.sup.M major segments. Next, obtain the maximum difference between the n-th major sampling line and the n-th major Gamma segment; according to the maximum difference, select (2.sup.Rn-1) minor sampling pixel data from the n-th major Gamma segment. Last, store the Gamma corresponding relationship of all major and minor sampling pixel data in the Gamma table. The execution of Gamma correction includes the following steps. First, select the a-th major sampling pixel datum according to the first M bits of an input pixel datum. Next, select the b-th and the (b+1)-th minor sampling pixel data according to the (M+1)-th bit to the (M+R.sub.a)-th bit of the input pixel datum. Finally, obtain the Gamma corresponding relationship of the input pixel datum via interpolation using the b-th and the (b+1)-th minor sampling pixel data.

Summary of Invention Paragraph:
[0008] In order to speed up Gamma correction, a conventional approach is to reduce the size of Gamma table by storing the Gamma relationships of a part of pixel data only, leaving the Gamma relationships of the rest to be obtained via interpolation according to the Gamma relationships of the stored pixel data which are adjacent to the pixel data whose Gamma relationship are to be obtained. The selected and stored pixel data are called the "sampling pixel data". One of the conventional sampling methods for sampling pixel data is to sample pixel data at a fixed interval. That is to say, the difference

between every sampling pixel datum and its adjacent sampling pixel datum is a fixed value. When ranked in order, the pixel data will show an arithmetical series.

Summary of Invention Paragraph:
[0013] According to the object of the invention, a method for constructing a Gamma table to perform Gamma correction according to the Gamma table so as to obtain a Gamma relationship of binary pixel data of J bits. The construction of Gamma table includes steps thereinafter. First, (2.sup.M+1) major sampling pixel data are selected from a Gamma curve, wherein the major sampling pixel data are sequentially numbered from a first major sampling pixel datum to a (2.sup.M+1)-th major sampling pixel and divide the Gamma curve into 2.sup.M major segments, sequentially numbered from a first major Gamma segment to a 2.sup.M-th major Gamma segment, where M is a positive integer smaller than J. Next, every two adjacent major sampling pixel data are employed to form 2.sup.M main sampling lines, sequentially numbered from a first major sampling line to a 2.sup.M-th major sampling line, wherein the n-th major sampling line corresponds to the n-th major Gamma segment and n is a positive integer ranging from 1 to 2.sup.M. Following that, a maximum difference D.sub.n between every n-th major sampling line and n-th major Gamma segment is calculated. According to the maximum difference D.sub.n, (2.sup.Rn-1) minor sampling pixel data are then selected from the n-th major Gamma segment, sequentially numbered from a first minor sampling pixel datum to a (2.sup.Rn-1)-th minor sampling pixel datum, wherein R.sub.n is a value corresponding to the n-th major sampling pixel datum and the n-th major Gamma segment. Finally, the Gamma relationships of all major and minor sampling pixel data are stored in the Gamma table. Further, Gamma correction of an input pixel datum according to the Gamma table includes the following steps. First of all, the a-th major sampling pixel datum is selected according to the first M bits of the input pixel datum, wherein `a` is a positive integer of 1 to 2.sup.M. Next, the b-th and the (b+1)-th minor sampling pixel data are selected according to the (M+1)-th bit to the (M+R.sub.a)-th bit of the input pixel datum, wherein b is a positive integer of 1 to R.sub.a. Finally, the Gamma corresponding relationship of the input pixel datum is determined via interpolation using the b-th and the (b+1)-th minor sampling pixel data.

CLAIMS:

1. A method for constructing a Gamma table to perform Gamma correction according to the Gamma table so as to obtain a Gamma relationship of an input pixel datum, wherein the pixel datum is represented by a binary datum of J bits and J is a positive integer, the method comprising the steps of: a) constructing a Gamma table, wherein the Gamma table comprises a plurality of sampling pixel data and the corresponding Gamma relationship for every sampling pixel datum; each of the sampling pixel data is a binary datum of J bits; and the Gamma table is constructed by at least the steps of: a1. selecting (2.sup.M+1) major sampling pixel data from a Gamma curve, wherein the (2.sup.M+1) major sampling pixel data are sequentially numbered from a first major sampling pixel datum to a (2.sup.M+1)-th major sampling pixel datum, and further divide the Gamma curve into 2.sup.M major segments, sequentially numbered from a first major Gamma segment to the 2.sup.M-th major Gamma segment, where M is a positive integer smaller than J; a2. using every two adjacent major sampling pixel data to form 2.sup.M major sampling lines, sequentially numbered from a first major sampling line to a 2.sup.M-th major sampling line, wherein the n-th major sampling line corresponds to the n-th major Gamma segment where n is a positive integer ranging from 1 to 2.sup.M; a3. determining a maximum difference D.sub.n between the n-th major sampling line and n-th major Gamma segment; a4. according to the maximum difference D.sub.n, selecting (2.sup.Rn-1) minor sampling pixel data from the n-th major Gamma segment, which are sequentially numbered from a first minor sampling pixel datum to a (2.sup.Rn-1)-th minor sampling pixel datum, wherein R.sub.n is a value corresponding to the n-th major sampling pixel datum and the n-th major Gamma segment; and a5. storing the Gamma relationship of these major and minor sampling pixel data in the Gamma table; and b) executing Gamma correction according to the Gamma table to obtain the Gamma relationship of the input pixel datum, comprising the following steps: b1. selecting the a-th major sampling pixel datum according to first M bits of the input pixel data, wherein a is a positive integer of 1 to 2M; b2. selecting corresponding b-th and (b+1)-th minor sampling pixel data of the a-th major sampling pixel datum, according to (M+1)-th to (M+R.sub.a)-th bits of the input pixel data, wherein `b` is a positive integer of 1 to R.sub.a; and b3. obtaining the Gamma corresponding relationship of the input pixel datum via interpolation using the b-th and

the (b+1)-th minor sampling pixel data.

14. A method for performing Gamma correction on an input pixel datum according to a Gamma table, the Gamma table having (2.sup.M+1) major sampling pixel data, sequentially numbered from a first major sampling pixel datum to a (2.sup.M+1)-th major sampling pixel datum, with (2.sup.Rn-1) minor sampling pixel data which exist between the n-th and the (n+1)-th major sampling pixel data and are sequentially numbered from a first minor sampling pixel datum to a (2.sup.Rn-1)-th minor sampling pixel datum, wherein the input pixel datum is a binary datum of J bits; J is a positive integer larger than both positive integers M and N while n is a positive integer ranging from 1 to 2.sup.M; R.sub.n is a value corresponding to the n-th sampling pixel datum; the method the steps of: selecting the a-th major sampling pixel datum according to first M bits of the input pixel datum, wherein a denotes a positive integer of 1 to 2.sup.M; selecting the b-th and the (b+1)-th minor sampling pixel data according to first (M+1)-th bit to (M+R.sub.a)-th bit of the input pixel datum, wherein b denotes a positive integer of 1 to R.sub.a; and obtaining the Gamma corresponding relationship of the pixel datum via interpolation using the b-th and the (b+1)-th minor sampling pixel data.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw. Desc | Ima

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☐ 8. Document ID: US 20030215129 A1

L1: Entry 8 of 59 File: PGPB Nov 20, 2003

DOCUMENT-IDENTIFIER: US 20030215129 A1
TITLE: Testing liquid crystal microdisplays

Detail Description Paragraph:
[0049] Using the measured data B(g), g=0 . . . n from typical E-O curve 402, the maximum brightness Bmax=Max(B(g), g=0 . . . n) may be found. From the g value corresponding to Bmax, the driving voltage Vbright can be obtained through the inverted mapping of v=G.sup.-1(g). The inverted mapping is simply looking up the gamma table. If the gray step is coarse or no E-O curve fitting is performed, a more accurate value of Bmax may fall into a range of [B(v1), B(v2)] in the vicinity of searched Bmax. Under a reasonable assumption on the shape of the E-O response curve 402, the more accurate Bmax value can be obtained by an interpolation. Similarly, if an E-O response at a percentage of the maximum brightness Bp=Bmax*a% is desired, the correspondent g is searched, and Vbright is mapped. Due to the discrete nature of the gray shade g and measured brightness B(g), the desired Bp and its Vp falls into a range of [B(v1), B(v2)]; therefore, an interpolation may be performed, which could be any appropriate interpolation such as parabolic interpolation. The interpolation again accords to a reasonable assumption on the shape of the E-O response curve 402. ***If the Vbright or Vp is the main purpose of the E-O response measurement, a further fine tuning of the measurement may be performed. For example, repeating the steps in the method of testing for LC microdisplay defects (Summary of the Invention) described above with a different gray chart test image and solid gray test image. The gray test image has a gray level closer to the one generated by previously found Vbright or Vp, hence the gray level makes the flat field correction more effective. The new gray chart has clusters of gray zones evenly arranged cross the test image, with each cluster having finer steps of a gray-level through the gray zones. A Vbright or Vp can be computed from each cluster and the average of the values may give a more accurate measurement of Vbright and Vp.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw. Desc | Ima

☐ 9. Document ID: US 20030169355 A1

L1: Entry 9 of 59 File: PGPB Sep 11, 2003

DOCUMENT-IDENTIFIER: US 20030169355 A1

TITLE: Solid-state image pickup apparatus with horizontal thinning and a signal reading method for the same

Detail Description Paragraph:

[0064] The memory temporarily stores the digital image data 18c or, in the specific application described above, the image data including the level-adjusted pixel data output from the selecting and shifting circuit. In any case, the image data read out from the memory are input to the gamma corrector. In an application in which image data are repeatedly read out from the memory, the memory should preferably be implemented as a nonvolatile memory. The gamma corrector, including a lookup table for gamma correction by way of example, executes gamma correction with the input image data as one of preprocessing steps that precede the actual image processing stage. The gamma-corrected image data output from the gamma corrector are delivered to the estimated value calculator and pixel interpolator.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Ima

☐ 10. Document ID: US 20030137695 A1

L1: Entry 10 of 59 File: PGPB Jul 24, 2003

DOCUMENT-IDENTIFIER: US 20030137695 A1

TITLE: Data conversion apparatus for and method of data conversion for image processing

Detail Description Paragraph:

[0154] As in the above process of making the first division for the computation, the computation division i is similarly specified in a sequential manner by incrementing I, and the process is repeated for m-1=7 or 7=i in steps .gamma.p6, .gamma.p7, .gamma.p4, .gamma.p5 and .gamma.p6. If the flag is already 1, the corresponding processor element does not update its parameter setting register to A=ai and B=bi. After performing M-1=7 division, each of the processor elements PEo through PEn holds its parameter setting register the parameters A=ai, B=bi for the division to which its gradation data belongs. The global processor provides the processor elements PEo through PEn with computational instructions including Y=A.X+B where X is gradation data. The processor elements PEo through PE compute Y=A.X+B form A=ai and B=bi in the parameter setting registers. The data expressing the computed Y, the .gamma.-converted gradation data is stored in its output register in a step .gamma.p8. The global processor 38 writes the output register data (AD o through AD n: the computed Y) from the output registers of the processor elements PEo through PEn in the output data area in the RAM's of the processor elements. The global processor 38 instructs to read from the memory controller specifies the read/write of the .gamma.-converted LUT in the memory controller setting register. The above memory controller writes the .gamma. conversion data or the .gamma. conversion table in a step .gamma.p9 for each value 0 through 255 gradation data in a specified area of the RAM's 0 through 17 that are specified by the setting information in the LUT. In the above interpolation computation in the above first preferred embodiment, the following is repeated for m times for i=1 through Dn for the processor elements PE, the concurrent provision of the boundary value of the ith division for the processor element group, and the concurrent provision of the interpolation parameter for the ith division as well as the computation instruction with the specified equation, as a result, the

conversion of the gradation data group Do through Dn is completed. The processor element group performs the computation only once, and the conversion speed is fast. When a total of two hundred fifty-six gradation data is concurrently .gamma.-converted using two hundred fifty-six of the three hundred twenty data processing means PE, a number of data processing steps is small in the image processing device 33. In comparison to the conventional method of repeating .gamma.-conversion of the gradation data two hundred fifty-six times, a number of steps is substantially reduced, .gamma.-conversion LUT is generated at a rapid pace. The above .gamma.-conversion is modified by changing the .gamma.-conversion characteristics of the printer .gamma.-conversion program in the output correction program in the program RAMs 0 through 17 as written in the step p9 in FIG. 19 is written to two of the RAM's 0 through 17 so that one is used for converting the even-numbered pixel image data. FIG. 21 illustrates a .gamma.-conversion data flow for converting R image data. The data conversion is substantially the same for the G image data and the R image data. The R image data of the adjacent pixels include the odd-numbered pixel R image data and the even-numbered pixel R image data that are concurrently outputted to a memory controller via the single image port. As shown in FIG. 21, the memory controller concurrently gives a first and second addresses respectively to the first and second RAM's as a reading address and the first and second RAM's respectively store a first and second .gamma.LUT-R. The first and second reading addresses are respectively determined by adding the first .gamma.LUT-R write begin address and the odd-numbered pixel R image data and by adding the second .gamma.LUT-R write address and the even-numbered pixel R image data. The first .gamma.-conversion data (the first .gamma.LUT-R data) and the second .gamma.-conversion data (the second .gamma.LUT-R data) are read and concurrently outputted to the SIMD-type processor 33. Instead of directly giving the memory controller the input image data from the image port, the image data is temporarily stored in the RAM's 1 through 17 and is optionally given to the memory controller. Similarly, instead of directly giving the SIMD-type processor 33 the .gamma.-conversion data from the LUT, the .gamma.-conversion data is temporarily stored in the RAM's 0 through 17 before outputting.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Ima

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☐ 11. Document ID: US 20030131038 A1

L1: Entry 11 of 59 File: PGPB Jul 10, 2003

DOCUMENT-IDENTIFIER: US 20030131038 A1
TITLE: Data conversion method, a data conversion circuit and a data conversion program

Summary of Invention Paragraph:
[0019] Further, the interpolation-processing may be a linear interpolation in the first, second and third methods of data conversion according to the present invention. In addition, the conversion may be gamma conversion. Furthermore, the method may further comprises: a step (g) of disassembling the data into two sections in order to express data having the same bit numbers as that of the input data in the form of 2.sup.-A B by using natural numbers A and real numbers B; a step (h) of reading two converted data, of which one corresponds to each of the two sections, from a table storing the converted data obtained by predetermined-converting of a plurality of data which have equivalent periods; and a step (i) of obtaining converted data expressed in the form of 2.sup.-A B by multiplying two converted data, wherein; the converted data which is stored in the memory means is obtained by repeating the steps (g) to (i) for a plurality of data.

Summary of Invention Paragraph:
[0034] Here, the step (f) may be a means for generating output data by interpolation-processing based on the first and the second converted data in the first, second and third programs of data conversion according to the present invention. Further, the interpolation-processing may be a linear interpolation. In addition, the predetermined-conversion may be gamma conversion. Furthermore, the program may further comprise: a step

(g) of disassembling the data into two sections in order to express the data having the same bit numbers as that of the input data as the form of 2.sup.-A B by using natural numbers A and real numbers B; a step (h) of reading two converted data corresponding to each of the two sections from a table storing the converted data obtained by predetermined-converting of a plurality of data which have equivalent periods; and a step (i) of obtaining converted data expressed in the form of 2.sup.-A B by multiplying the two converted data, wherein the converted data are obtained by repeating the step (g) to (i) for a plurality of data.

☐ 12. Document ID: US 20030116748 A1

L1: Entry 12 of 59 File: PGPB Jun 26, 2003

DOCUMENT-IDENTIFIER: US 20030116748 A1
TITLE: Environmentally friendly compositions having anti-icing, deicing or graffiti prevention properties

CLAIMS:

51. A method to selectively blend, in-situ, an aircraft type specific version of the composition of the anti-icing or deicing fluid of the composition of claim 19; which, as with all the fluid compositions claimed in the instant invention is a pseudoplastic non-Newtonian fluid having those rheological behaviors characteristic of Ellis fluids, which possess finite rheological yield strengths that must be overcome prior to any shear stress induced fluid flow, and, noting that in general the heavier transport aircraft types have higher airspeeds of rotation and to takeoff than do the lighter commuter type aircraft, whose rheological properties are hereby specifically tailored to meet the specific aircraft-type's unique viscosity-airspeed shear thinning specification requirements that the applied high static viscosity fluid composition is sufficiently shear thinned by aerodynamic stress so as to be shed from the surfaces given the ice protection as the aircraft's takeoff acceleration increases its speed to where it reaches its rotational speed, with the concomitant higher aerodynamic shear stress, wherein the over all affects of the xanthan concentration on the viscosity of said fluid far exceeds the viscosity contribution of any other component, the determination of compositional viscosity to assure the proper shear thinning reduces to finding the proper xanthan concentration in the anti-icing and deicing fluid composition which method comprises: (a) selecting the aircraft type whose surfaces are to be given icing protection, and obtaining the given aircraft published rotational and takeoff airspeeds for the given aircraft's loading; (b) utilizing the rotational and takeoff airspeed data for the selected aircraft, and the ambient temperature, determine the drag per unit area, D/S referred to herein as drag effect, from the following equation: D/S=1/2 .rho.C.sub.D U.sup.2 wherein: D is the aerodynamic drag for unit area S, D/S is the so-called drag effect, .rho. is the density altitude of the ambient air, C.sub.D is the aerodynamic coefficient of drag of the surface, and U is the air flow velocity over the surface (c) correlating the yield stress .tau..sub.o, which must be equal to the Ellis fluid yield strength in order for fluid flow to commence, to the drag effect D/S, using the equation: .tau..sub.o=D/S (d) correlate this yield stress .tau..sub.o, obtained from step (c) to yield stress equivalent airspeed, where the following equation is used to simplify the calculations: q=1/2 .rho.U.sup.2 where: q is the dynamic air pressure, .rho. is the air mass density and is equal to 0.002378 lbs sec.sup.2/ft.sup.4, from standard published aerodynamic tables, D is the induced drag and is equal to 0.5 .rho. U.sup.2 C.sub.D S=q C.sub.DS, Wherein: S is the surface area, U is the free stream air velocity, .rho. is the .rho. cited above, C.sub.D is the aerodynamic coefficient of drag, Q is the air mass density cited above, And assuming for an educating example that, for calculations for an aircraft applications whose rotation speed is approximately 100 knots, that: (1) R.sub.e is the Reynolds number, obtained from published tables, is equal to 0.5.times.10.sup.5

for 100 knots, (2) C.sub.D is the surface flat plate tangential coefficient of drag, which value is between 0.01 and 0.007, as reported in published aerodynamic tables, (3) .tau..sub.o is the yield stress which is to be correlated to the airspeed, and obtained from step (b), and performing the simple math utilizing the equation and noting that the induced drag D at airspeed velocity U must equal the yield stress .tau..sub.o in order for fluid shear thinning to occur, the correlation of yield stress to airspeed is thus readily calculated, with the proviso that the calculation use values used for C.sub.D at both extremes of 0.01 and 0.007 and the calculated airspeeds are judiciously confirmed by test flights, (e) having also thus obtained from step (c) the .tau..sub.o value of yield stress, determine the near static viscosity .eta..sub.o from data preferably obtained for samples of composition of the fluid of intended use, or as a reasonable approximation, using the data obtained from rheological measurements of a fluid sample of claim 19, wherein the said composition comprised 55.0 wt % 1,2-propylene glycol, 0.5 wt % xanthan, and 44.5 wt % water, and from said 20.degree. C. data a plot of the square root of the apparent viscosity against the reciprocal of the square root of the shear rate gives a slope of 71.8, the square of which provides a .tau..sub.o value for the fluid of 51.6 dynes/cm.sup.2, using the equation: .eta..sub.o.sup.1/2=.eta..sub..infin..sup.1/2+.tau..sub.o{dot over (.gamma.)}.sup.-1/2wherein: {dot over (.gamma.)} is the shear rate, d.gamma./dt, in reciprocal seconds, .eta. is any viscosity, cPs, in centiPoise seconds, .eta..sub.o is the near static viscosity, at essentially zero shear rate or 0.0102 sec.sup.-1, .eta..sub..infin.is the limiting or infinite shear rate viscosity, and .tau..sub.ois the yield stress, in dynes/cm.sup.2, noting that .eta..sub..infin., the limiting viscosity at infinite shear rate, is a very low value of about 200 to 300 cPs as compared to the 50,000 cPs or higher values for .eta..sub.o, the near static viscosity, and thus equating the .eta..sub..infin..sup.1/2 term to zero and omitting it from the equation, and still maintaining acceptable accuracy; (f) squaring the resulting equation, wherein the term .eta..sub..infin..sup.{fraction (1/2)} is omitted; from step (d) to obtain: .eta..sub.o=.tau..sub.o{dot over (.gamma.)}.sup.-1, as a reasonable approximation, wherein the applied rate of used to measure the near static low shear rate viscosity is approximately 0.106 sec.sup.-1, a constant which allows the direct determination of .eta..sub.o that correlates to .tau..sub.o; (g) using data of viscosity versus thickener concentration, at the appropriate temperatures 20.degree. C., 0.degree. C., and -40.degree. C., obtained preferably for the fluid of intended use to generate a useful plot, determine the concentration, wt %, of the thickener xanthan in solution needed to provide the viscosity, .eta..sub.o, required for the intended fluid applications: or as a reasonable approximation, using the data obtained from rheological measurements of a series of fluid samples of claim 19, wherein said compositions comprise a group consisting of 0.25 wt %, 0.375 wt % and 0.50 wt % xanthan thickened fluids, each further containing 55.0 wt %1,2-propylene glycol and 44.5 wt % water, and from said 20.degree. C. data a plot of near static viscosity, .eta..sub.o, with thickener concentration, gives a slope of 26.04.times.10.sup.4 which, by using the equation: y=mx+b, wherein: m is the slope, of the viscosity versus thickener concentration curve y and b are near static viscosities at two different thickener concentrations and, x is the difference in thickener concentration along the plot's abscissa; (h) repeating the data acquisition of step (f) at 0.degree. C. and -40.degree. C., interpolate the results to approximate the ambient temperature of intended fluid application, and adjusting for temperature corrections by using the said data; (i) obtaining the anti-icing fluid composition tailored to meet the specific aircraft application; and (j) preparing the liquid anti-icing fluid having the composition obtained in step (h), by blending in-situ through controllably variable proportioning mixing valves, conjoined or upstream of the pressure nozzle, fluids whose combination herein results in the proper final fluid composition.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw. Desc | Ima

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☐ 13. Document ID: US 20030102428 A1

L1: Entry 13 of 59 File: PGPB Jun 5, 2003

h e b b g e e e f e c ef b e

DOCUMENT-IDENTIFIER: US 20030102428 A1
TITLE: Maintaining measurement accuracy in prompt gamma neutron activation analyzers with variable material flow rates or material bed depth

CLAIMS:

2. A method of maintaining measurement accuracy of specific constituents in prompt gamma neutron activation analyzers in a flow of bulk material having a known range of flow rates comprising the steps of: (a) providing a plurality of samples of the bulk material in the form of standard geometric units, each said unit having the same concentration of the specific constituent to be measured and arranging said units in a form that can pass through the analyzer in the same manner as the bulk material; (b) arranging said units for insertion into the analyzer in geometries and quantities referred to as loading profiles that range from the smallest to the largest flow rates to be expected with the specific bulk material and the specific analyzer; (c) successively inserting each of the loading profiles into the analyzer and measuring long enough to yield a measurement uncertainty that is small compared to the observed differences in analysis results from one loading to another, and recording these results and computing the differences of the measurements between loading profiles, hereafter referred as measured errors, in a table, and then removing the loaded profiles; (d) determining the expected errors for each constituent at the current real-time flow rate of the unknown material by using techniques of mathematical interpolation to derive the best estimates of the measurement error by using error values from testing at both higher and lower belt loadings than the current real-time flow rate; and, (e) subtracting the estimated or predicted measurement errors determined in the prior step from the measured values to determine the corrected or true value.

5. A method of maintaining measurement accuracy of specific constituents in prompt gamma neutron activation analyzers in a flow of bulk material having a known range of flow rates comprising the steps of: (a) providing a plurality of samples of the bulk material in the form of standard geometric units, each said unit having the same concentration of the specific constituent to be measured and said units in a form that can be arranged to pass through the analyzer in the same manner as the bulk material; (b) arranging said units for insertion into the analyzer in geometries and quantities referred to as loading profiles that range from the smallest to the largest flow rates to be expected with the specific bulk material and the specific analyzer; (c) successively inserting each of the loading profiles into the analyzer and measuring long enough to yield a measurement uncertainty that is small compared to the observed differences in analysis results from one loading to another, and recording these results and computing the differences of the measurements between loading profiles, hereafter referred as measured errors, in a table, and then removing the loaded profiles; (d) repeating step (c) with at least one more set of unit standards having a different chemistry; (e) determining which specific set of unit standards matches most closely the current real-time PGNAA measured chemistry, and selecting the specific set of measured data from step (c) for input to the next step; (f) determining the expected errors for each constituent at the current real-time flow rate by using techniques of mathematical interpolation of the data set determined in steps (c) and (e) to derive the best estimates of the measurement error by using error values from testing both at higher and lower belt loadings than the current real-time flow rate; (g) subtracting the estimated or predicted measurement errors determined in the prior step to determine the corrected or true value.

8. A method of maintaining measurement accuracy of specific constituents in prompt gamma neutron activation analyzers in a flow of bulk material having a known range of flow rates comprising the steps of: (a) providing two or more sets of chemistries, each set comprised of a plurality of samples of the bulk material in the form of standard geometric units, each said unit having the same concentration of the specific constituent to be measured and said units in a form that can be arranged to pass through the analyzer in the same manner as the bulk material; (b) arranging said units for insertion into the analyzer in geometries and quantities referred to as loading profiles that range from the smallest to the largest flow rates to be expected with the specific bulk material and the specific analyzer; (c) successively insert different chemistry sets into the analyzer and

measuring long enough to yield a measurement uncertainty that is small compared to re-measurement, and recording these results in a table of calibration data with an associated loading; (d) repeating steps (b) and (c) for each loading profile determined in step (a); (e) calibrating the PGNAA device separately for each constituent and each loading profile and storing the loading specific sets of calibration parameters for each measured constituent in a data table accessible by the PGNAA device; (f) determining by utilizing the current real-time loading signal, which two loading specific sets of calibration parameters determined and stored in step (e) bracket the current loading profile; (g) utilizing the current real-time loading signal, generate a set of calibration parameters for each measured constituent that is optimal for the current loading, by mathematical interpolation on the two loading specific calibration parameter sets that bracket the current loading; (h) applying that loading specific calibration set determined by interpolation to the PGNAA device in order that the real-time measured values are high in accuracy.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Ima

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☐ 14. Document ID: US 20030020703 A1

L1: Entry 14 of 59 File: PGPB Jan 30, 2003

DOCUMENT-IDENTIFIER: US 20030020703 A1
TITLE: System for distributing and controlling color reproduction at multiple sites

Detail Description Paragraph:
[0154] Referring to FIG. 4C, device independent color coordinates XYZ are input signals to display 17. Rendering employs the inverse of the operations used for imagical 14. The inverse of the calibration matrix M is called A.sup.- (to emphasize that we are considering numerically different matrices for the two devices) and is used to convert the XYZ input signals to linear device signals R'.sub.lin, G'.sub.lin and B'.sub.lin. The linear device signals R'.sub.lin G'.sub.lin and B'.sub.lin are postconditioned using the inverse of the compensation function LUTs which define the non-linear relationship between applied signal and luminous output of display 17, a function which is defined and adjusted in a separate, empirical step of calibration. The output from the LUTs are gamma corrected signals R.sup.1/.lambda., G.sup.1/.lambda., and B.sup.1/.lambda. representing the input to display 17. Note that there is no necessary relationship between the matrices A.sup.-1 and M in FIGS. 4B and 4C. Further, since the LUTs of FIGS. 4B and 4C may be used with various types of transformations in system 100, they are preferably represented by a separate data structure, within the software architecture, which may be combined like building blocks with other structures, such as 3.times.3 matrix, or multidimensional interpolation table, to form more complex data structures.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Ima

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☐ 15. Document ID: US 20030002735 A1

L1: Entry 15 of 59 File: PGPB Jan 2, 2003

DOCUMENT-IDENTIFIER: US 20030002735 A1
TITLE: Image processing method and image processing apparatus

Detail Description Paragraph:
[0156] The gamma values of R, B and Ir with respect to G are compared. If they are not within a predetermined range, a difference is found to create the LOOKUP TABLE (LUT) for correction, as shown in FIG. 8 (Step a3). Since it is difficult to create a step tablet T0 for all densities, The Lookup Table (LUT) is subjected to linear interpolation, as shown in FIG. 9, whereby the insufficient area of the LOOKUP TABLE (LUT) is filled up.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw. Desc | Ima

☐ 16. Document ID: US 20020163676 A1

L1: Entry 16 of 59 File: PGPB Nov 7, 2002

DOCUMENT-IDENTIFIER: US 20020163676 A1
TITLE: System for optimizing the display and rendering of digital images for digital mastering

Detail Description Paragraph:
[0039] Next, the digital signals in each channel are processed in a sequence of look up tables (LUTs). First, bit depth scaling of the digital image signal source from 10 bits/channel to 12 bits/channel is performed in a scaling step, using a 1D LUTs 104 in each channel. This LUT is also used to implement a function to allow for non-linear interpolation between nodes of a 3D look up table that otherwise would be linear as implemented in the hardware due to the inherent fixed spacing between the nodes of the 3D LUT in hardware. Additionally, any traditional 1D LUT processing (e.g. gamma adjustment) can be implemented at this point. The distinguishing element within the workflow of the invention is the application of a re-configurable 3D look up table ASIC (in combination with the other matrices and 1D look up tables implemented in FPGA hardware) in a group of 3D LUTs 106, 108 and 110. A 3D LUT provides a known technique of interpolation over a regular grid of points, or nodes, in three dimensions, where the input is a triad (e.g., RGB) of values and the output is a triad of processed values. Color processing is obtained by using 12 bit image data through the 3D LUT ASIC, enabling a colorist to add a given "look" to the data stream (e.g. a specific release print film "look" or other creative "look").

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw. Desc | Ima

☐ 17. Document ID: US 20020159083 A1

L1: Entry 17 of 59 File: PGPB Oct 31, 2002

DOCUMENT-IDENTIFIER: US 20020159083 A1
TITLE: Color matching server, color matching client, print control server, print control client, print control system, print control process, medium on which print control program is stored profile providing server and profile demanding client

Detail Description Paragraph:
[0388] In this way, it is possible to make the print color data correspond to the standard color space coordinate value regardless of difference between individual bodies of the ink-jet printer 140a. Step S2270 analyzes the correspondence table J to create the ICC profile K of the printer. This profile creation is carried out for individual ual demands for profile creation, as a matter of course. The algorism of this profile creation can be accomplished by using various known methods such as interpolation

operation, color prediction, and gamma bit-mapping. FIG. 38 schematically shows the thus created printer ICC profile K.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Ima

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☐ 18. Document ID: US 20020158882 A1

L1: Entry 18 of 59 File: PGPB Oct 31, 2002

DOCUMENT-IDENTIFIER: US 20020158882 A1
TITLE: Auto gamma correction system and method for displays with adjusting reference voltages of data drivers

CLAIMS:

9. An auto gamma correction method for displays with adjusting reference voltages of data drivers, by spatial-dithering technology with two specific gray-levels to generate an arbitrary gray patch, comprising: (a) selecting two of Gamma reference voltages, wherein several gray levels exist, to be corrected at first; then generating two gray patches, one is generated by spatial dithering technology, the other is a continuous pixel gray patch; their luminance should be within those bounded by the two selected Gamma voltages; (b) adjusting the digital code of the continuous pixel gray patch from a distance, until the luminance of continuous pixel gray patch looks matching that of the spatial dithering gray patch, then recording the final digital code d.sub.1 of the continuous pixel gray patch; (c) generating another two gray patches that different from those of the step (a), one is generated by spatial dithering technology, the other is a continuous pixel gray patch; (d) adjusting the digital code of the continuous pixels gray patch from a distance, until the luminance of gray patch looks matching that of the spatial dithering gray patch, recording the final digital code d.sub.2 of the continuous pixel gray patch; (e) figuring out the voltage values (V.sub.dl, V.sub.d2) corresponded to the digital codes (d.sub.1, d.sub.2) by the lookup table and the interpolation method; (f) finding out the final target voltages for the two selected external Gamma reference voltages; (g) adjusting the two external Gamma reference voltages of step (f) to their target values by a group of programmable Gamma voltage generating circuits, then applying the determined voltages to data drivers; (h) selecting another one Gamma voltage to be next adjusted; then determining the gray-level of the spatial-dithering gray patch for this selected Gamma voltage according to a set of pre-storage gray levels corresponded to the external reference voltages of the data drivers; (i) generating a gray patch with the determined gray level by means of spatial dithering technology; then determining the target value of this Gamma voltage via the users' visual matching process. (j) adjusting the input Gamma voltage of data drivers to its target value by the programmable Gamma voltage generating circuits. (k) repeating step(h).about.(j) until all the Gamma reference voltages have been set.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Ima

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☐ 19. Document ID: US 20020154325 A1

L1: Entry 19 of 59 File: PGPB Oct 24, 2002

DOCUMENT-IDENTIFIER: US 20020154325 A1
TITLE: System for distributing and controlling color reproduction at multiple sites

Detail Description Paragraph:
[0132] Referring to FIG. 4C, where device independent color coordinates XYZ are input signals to display 17. Rendering employs the inverse of the operations used for imagical 14. The inverse of the calibration matrix M is called A.sup.-1 (to emphasize that we are considering numerically different matrices for the two devices) and is used to convert the XYZ input signals to linear device signals R'.sub.lin, G'.sub.lin and B'.sub.lin. The linear device signals R'.sub.lin, G'.sub.lin and B'.sub.lin, are postconditioned using the inverse of the compensation function LUTs which define the non-linear relationship between applied signal and luminous output of display 17, a function which is defined and adjusted in a separate, empirical step of calibration. The output from the LUTs are gamma corrected signals R.sup.1/.gamma., G.sup.1/.gamma., and B.sup.1/.gamma. representing the luminous output of display 17. Note that there is no necessary relationship between the matrices A.sup..-1 and M in FIGS. 4B and 4C. Further, since the LUTs of FIGS. 4B and 4C may be used with various types of transformations in system 100, they are preferably represented by a separate data structure, within the software architecture, which may be combined like building blocks with other structures, such as 3.times.3 matrix, or multidimensional interpolation table, to form more complex data structures.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw. Desc | Ima

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☐ 20. Document ID: US 20020141656 A1

L1: Entry 20 of 59 File: PGPB Oct 3, 2002

DOCUMENT-IDENTIFIER: US 20020141656 A1
TITLE: Image file generating program product, an image processing program product, an image file generating apparatus, and an image file generating method

Detail Description Paragraph:
[0069] Subsequently, an interpolation magnification is calculated and determined based on the size data and the resolution of the printer 22 stored in the third storage area 303 (Step #29) and an interpolation is applied to the image data stored in the processing storage 125 (Step #31). The resulting image data is converted into a CMYK image data according to the type of the printer 22 and then converted into an 8-bit data by a .gamma.-table (Step #33). Thereafter, an outline emphasizing processing in conformity with the type of the printer 22 is applied (Step #35) and a print data is transmitted to the printer 22 (Step #37). Then, the printer 22 performs printing based on the received print data.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw. Desc | Ima

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☐ 21. Document ID: US 20010050777 A1

L1: Entry 21 of 59 File: PGPB Dec 13, 2001

DOCUMENT-IDENTIFIER: US 20010050777 A1
TITLE: Realization of an arbitrary transfer function

CLAIMS:

1. An image processing system comprising a gamma correction circuit for supplying an

output value (Y) in response to an input value (X) in accordance with a gamma correction function (F): Y=F(X), which gamma correction circuit comprises: an input section (INP) for deriving a table input value (XT) and an interpolator input value (XI) from the input value (X); a table (TBL) for supplying a table value (YT) in response to the table input value (XT); an interpolator (INT) for supplying an interpolation value (YI) in response to the interpolator input value (YI); and an output section (OUT) for combining the table value (YT) and the interpolation value (YI) so as to obtain the output value (Y), characterized in that the input section (INP) of the device comprises: an interval detector (DET) which defines a plurality of input value intervals (I1, I2), for supplying an interval indication (IND) which indicates the interval (I1, I2) in which the input value (X) lies; an input value former (IVC) for forming the table input value (XT) and the interpolator input value (XI) as a function of the interval indication (IND), the table input value (XT) and the interpolator input value (XI) being determined, respectively, by a more significant part (MSP) of the input value and the complementary less significant part (LSP) of variable magnitudes in accordance with the interval indication (IND).

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Ima

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☐ 22. Document ID: US 20010024284 A1

L1: Entry 22 of 59 File: PGPB Sep 27, 2001

DOCUMENT-IDENTIFIER: US 20010024284 A1
TITLE: Test printing method, information processing apparatus, and printing system

Detail Description Paragraph:
[0077] The output density characteristic shown in FIG. 6A is obtained by means of the 48 levels of density values obtained at step S22 and an interpolation operation using these values. In this embodiment, a printer showing such a characteristic is subjected to the calibration comprising a process of renewing the contents of a .gamma. correction table used to generate print data for the printer, based on the output density characteristic. Specifically, a combination of the .gamma. correction table with the output density characteristic are made to have contents such as those shown in FIG. 6B so as to have a linear input-output relationship as shown in FIG. 6C. That is, the contents of the table must have the input-output relationship shown in FIG. 6B, which constitutes a reverse function for the input-output function shown in FIG. 6A.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Ima

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☐ 23. Document ID: US 6700561 B1

L1: Entry 23 of 59 File: USPT Mar 2, 2004

DOCUMENT-IDENTIFIER: US 6700561 B1
TITLE: Gamma correction for displays

Detailed Description Text (12):
To reduce the amount of storage space needed to hold the step values in the memory 14, the memory 14 is loaded with a reduced number of step values. This reduced number of step values is substantially less than the number of step values needed when a step value is

provided for each clock period. In a preferred embodiment, there are 32 step values for each color. The step values may be generated by performing a piecewise linear interpolation of a chosen inverse gamma curve. The number of time cycles for which a step value is used may vary depending on the part of the curve being modeled. For example, the step values may be chosen to increase the accuracy in the early part of the curve, where the slope of the curve changes very rapidly, at the expense of the ending part where the slope of the curve changes relatively slowly. Table I below shows an example of the number of times that each step value is used and the time cycle number at which each step value is first used in a preferred embodiment.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw. Desc | Ima

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☐ 24. Document ID: US 6690490 B1

L1: Entry 24 of 59 File: USPT Feb 10, 2004

DOCUMENT-IDENTIFIER: US 6690490 B1
TITLE: Image processor

Detailed Description Text (63):
FIG. 13 is a flowchart showing the procedure of the process of Step A2 of the main control process of the halftone output gradation processing section 28 in FIG. 12. When the user inputs a specification to copy the original through the control panel 16, the process advances to Step B2. The halftone output gradation processing section 28 finds the sum of the correction value on the reference correction curve to the specified density value and the correction amount corresponding to the specified density value in Step B2 and sets the obtained sum as a correction value to the specified density value. The halftone output gradation processing section 28 finds the correction amount to the remaining input density value other than the specified density value by the analogous interpolation process in FIG. 4 by using the correction amount to the specified density value in Step B3. The detail of the analogous interpolation process will be described later. Thus, the correction curve to be actually used in the gradation correcting process is created by the processes in Steps B2 and B3. The halftone output gradation processing section 28 creates the .gamma. correction table based on the created correction curve in Step B4 and then ends the process.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw. Desc | Ima

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☐ 25. Document ID: US 6690383 B1

L1: Entry 25 of 59 File: USPT Feb 10, 2004

DOCUMENT-IDENTIFIER: US 6690383 B1
TITLE: Color calibration of displays

CLAIMS:

5. A method as in claim 3, wherein the step of computing two sets of gamma tables includes using log-log linear interpolation.

☐ 26. Document ID: US 6657189 B2

L1: Entry 26 of 59 File: USPT Dec 2, 2003

DOCUMENT-IDENTIFIER: US 6657189 B2
TITLE: Maintaining measurement accuracy in prompt gamma neutron activation analyzers with variable material flow rates or material bed depth

CLAIMS:

3. A method of maintaining measurement accuracy of specific constituents in prompt gamma neutron activation analyzers in a flow of bulk material having a known range of flow rates comprising the steps of: (a) providing a plurality of samples of the bulk material in the form of standard geometric units, each said unit having the same concentration of the specific constituent to be measured and arranging said units in a form that can pass through the analyzer in the same manner as the bulk material; (b) arranging said units for insertion into the analyzer in geometries and quantities referred to as loading profiles that range from the smallest to the largest flow rates to be expected with the specific bulk material and the specific analyzer; (c) successively inserting each of the loading profiles into the analyzer and measuring long enough to yield a measurement uncertainty that is small compared to the observed differences in analysis results from one loading to another, and recording these results and computing the differences of the measurements between loading profiles, hereafter referred as measured errors, in a table, and then removing the loaded profiles; (d) determining the expected errors for each constituent at the current real-time flow rate of the unknown material by using techniques of mathematical interpolation to derive the best estimates of the measurement error by using error values from testing at both higher and lower belt loadings than the current real-time flow rate; and, (e) subtracting the estimated or predicted measurement errors determined in the prior step from the measured values to determine the corrected or true value.

9. A method of maintaining measurement accuracy of specific constituents in prompt gamma neutron activation analyzers in a flow of bulk material having a known range of flow rates comprising the steps of: (a) providing a plurality of samples of the bulk material in the form of standard geometric units, each said unit having the same concentration of the specific constituent to be measured and said units in a form that can be arranged to pass through the analyzer in the same manner as the bulk material; (b) arranging said units for insertion into the analyzer in geometries and quantities referred to as loading profiles that range from the smallest to the largest flow rates to be expected with the specific bulk material and the specific analyzer; (c) successively inserting each of the loading profiles into the analyzer and measuring long enough to yield a measurement uncertainty that is small compared to the observed differences in analysis results from one loading to another, and recording these results and computing the differences of the measurements between loading profiles, hereafter referred as measured errors, in a table, and then removing the loaded profiles; (d) repeating step (c) with at least one more set of unit standards having a different chemistry; (e) determining which specific set of unit standards matches most closely the current real-time PGNAA measured chemistry, and selecting the specific set of measured data from step (c) for input to the next step; (f) determining the expected errors for each constituent at the current real-time flow rate by using techniques of mathematical interpolation of the data set determined in steps (c) and (e) to derive the best estimates of the measurement error by using error values from testing both at higher and lower belt loadings than the current real-time flow rate; (g) subtracting the estimated or predicted measurement errors determined in the prior step to determine the corrected or true value.

15. A method of maintaining measurement accuracy of specific constituents in prompt gamma neutron activation analyzers in a flow of bulk material having a known range of flow

rates comprising the steps of: (a) providing two or more sets of chemistries, each set comprised of a plurality of samples of the bulk material in the form of standard geometric units, each said unit having the same concentration of the specific constituent to be measured and said units in a form that can be arranged to pass through the analyzer in the same manner as the bulk material; (b) arranging said units for insertion into the analyzer in geometries and quantities referred to as loading profiles that range from the smallest to the largest flow rates to be expected with the specific bulk material and the specific analyzer; (c) successively insert different chemistry sets into the analyzer and measuring long enough to yield a measurement uncertainty that is small compared to re-measurement, and recording these results in a table of calibration data with an associated loading; (d) repeating steps (b) and (c) for each loading profile determined in step (a); (e) calibrating the PGNAA device separately for each constituent and each loading profile and storing the loading specific sets of calibration parameters for each measured constituent in a data table accessible by the PGNAA device; (f) determining by utilizing the current real-time loading signal, which two loading specific sets of calibration parameters determined and stored in step (e) bracket the current loading profile; (g) utilizing the current real-time loading signal, generate a set of calibration parameters for each measured constituent that is optimal for the current loading, by mathematical interpolation on the two loading specific calibration parameter sets that bracket the current loading; (h) applying that loading specific calibration set determined by interpolation to the PGNAA device in order that the real-time measured values are high in accuracy.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Ima

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☐ 27. Document ID: US 6559826 B1

L1: Entry 27 of 59 File: USPT May 6, 2003

DOCUMENT-IDENTIFIER: US 6559826 B1
TITLE: Method for modeling and updating a colorimetric reference profile for a flat panel display

Detailed Description Text (43):
As illustrated, at step 920, a series of monochromatic windows having known primary colors are displayed at known relative light-source intensity settings on the display screen 210 of the flat panel LCD monitor 216. In the present embodiment, each image is displayed with the "red" lamps 132 and "blue" lamps 136 set at various intensity settings (e.g., settings 1, 2, 3 and 4 of Table 1). For example, a monochromatic window with sub-pixel values corresponding to pure white (e.g., RGB full on) is displayed at the four different light-source intensity levels of Table 1. Then, a monochromatic window with pixel values corresponding to pure red (e.g., R-pixels full on, G-pixels and B-pixels full off) is displayed at those relative light-source intensity levels. The process is repeated for a collection of different color values including green and blue. A collection of other various shades of red, green, and blue may also be displayed such that the natural gamma responses of the display screen 210 can be more accurately determined. It should be appreciated, however, that many other combinations of the intensity levels may also be used to achieve the goals of the present invention depending on the interpolative mathematic algorithms employed.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Ima

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☐ 28. Document ID: US 6507814 B1

L1: Entry 28 of 59 File: USPT Jan 14, 2003

DOCUMENT-IDENTIFIER: US 6507814 B1
TITLE: Pitch determination using speech classification and prior pitch estimation

Detailed Description Text (289):
The quantized fixed codebook gain is given as g.sub.c =.gamma.'.sub.c. For 11 kbps bit rate, the received adaptive codebook gain index is used to readily find the quantized adaptive gain, g.sub.p from the quantization table. The received fixed codebook gain index gives the fixed codebook gain correction factor .gamma.'. The calculation of the quantized fixed codebook gain, g.sub.c follows the same steps as the other rates. 2) Decoding of adaptive codebook vector: for 8.0, 11.0 and 6.65 (during LTP_mode=1) kbps bit rate encoding modes, the received pitch index (adaptive codebook index) is used to find the integer and fractional parts of the pitch lag. The adaptive codebook v(n) is found by interpolating the past excitation u(n) (at the pitch delay) using the FIR filters. 3) Decoding of fixed codebook vector: the received codebook indices are used to extract the type of the codebook (pulse or Gaussian) and either the amplitudes and positions of the excitation pulses or the bases and signs of the Gaussian excitation. In either case, the reconstructed fixed codebook excitation is given as c(n). If the integer part of the pitch lag is less than the subframe size 40 and the chosen excitation is pulse type, the pitch sharpening is applied. This translates into modifying c(n) as c(n)=c(n)+.beta.c(n-T), where .beta. is the decoded pitch gain g.sub.p from the previous subframe bounded by [0.2,1.0].

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Ima

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☐ 29. Document ID: US 6493665 B1

L1: Entry 29 of 59 File: USPT Dec 10, 2002

DOCUMENT-IDENTIFIER: US 6493665 B1
TITLE: Speech classification and parameter weighting used in codebook search

Detailed Description Text (275):
For rates 4.55, 5.8 and 6.65 (during PP.sub.13 mode) kbps bit rate encoding modes, the received pitch index is used to interpolate the pitch lag across the entire subframe. The following three steps are repeated for each subframe: 1) Decoding of the gains: for bit rates of 4.55, 5.8, 6.65 and 8.0 kbps, the received index is used to find the quantized adaptive codebook gain, g.sub.p, from the 2-dimensional VQ table. The same index is used to get the fixed codebook gain correction factor .gamma. from the same quantization table. The quantized fixed codebook gain, g.sub.c, is obtained following these steps: the predicted energy is computed ##EQU66## the energy of the unscaled fixed codebook excitation is calculated as ##EQU67## and the predicted gain g'.sub.c is obtained as g'.sub.c =10.sup.(0.05(E(n)+E-E.sup..sub.i .sup.). The quantized fixed codebook gain is given as g.sub.c =.gamma.g'.sub.c. For 11 kbps bit rate, the received adaptive codebook gain index is used to readily find the quantized adaptive gain, g.sub.p from the quantization table. The received fixed codebook gain index gives the fixed codebook gain correction factor .gamma.'. The calculation of the quantized fixed codebook gain, g.sub.c follows the same steps as the other rates. 2) Decoding of adaptive codebook vector: for 8.0 ,11.0 and 6.65 (during LTP_mode=1) kbps bit rate encoding modes, the received pitch index (adaptive codebook index) is used to find the integer and fractional parts of the pitch lag. The adaptive codebook v(n) is found by interpolating the past excitation u(n) (at the pitch delay) using the FIR filters. 3) Decoding of fixed codebook vector: the

received codebook indices are used to extract the type of the codebook (pulse or Gaussian) and either the amplitudes and positions of the excitation pulses or the bases and signs of the Gaussian excitation. In either case, the reconstructed fixed codebook excitation is given as c(n). If the integer part of the pitch lag is less than the subframe size 40 and the chosen excitation is pulse type, the pitch sharpening is applied. This translates into modifying c(n) as c(n)=c(n)+.beta.c(n-T), where .beta. is the decoded pitch gain g.sub.p from the previous subframe bounded by [0.2,1.0].

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw. Desc | Ima

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30. Document ID: US 6480822 B2

L1: Entry 30 of 59 File: USPT Nov 12, 2002

DOCUMENT-IDENTIFIER: US 6480822 B2
TITLE: Low complexity random codebook structure

Detailed Description Text (285):
For rates 4.55, 5.8 and 6.65 (during PP_mode) kbps bit rate encoding modes, the received pitch index is used to interpolate the pitch lag across the entire subframe. The following three steps are repeated for each subframe: 1) Decoding of the gains: for bit rates of 4.55, 5.8, 6.65 and 8.0 kbps, the received index is used to find the quantized adaptive codebook gain, g.sub.p, from the 2-dimensional VQ table. The same index is used to get the fixed codebook gain correction factor .gamma. from the same quantization table. The quantized fixed codebook gain, g.sub.c, is obtained following these steps: the predicted energy is computed ##EQU63## the energy of the unscaled fixed codebook excitation is calculated as ##EQU64## and the predicted gain g'.sub.c is obtained as g'.sub.c =10.sup.(0.05(E(n)+E-E.sub..sub.i .sup.).

Detailed Description Text (286):
The quantized fixed codebook gain is given as g.sub.c =.gamma.g'.sub.c. For 11 kbps bit rate, the received adaptive codebook gain index is used to readily find the quantized adaptive gain, g.sub.p from the quantization table. The received fixed codebook gain index gives the fixed codebook gain correction factor .gamma.'. The calculation of the quantized fixed codebook gain, g.sub.c follows the same steps as the other rates. 2) Decoding of adaptive codebook vector: for 8.0, 11.0 and 6.65 (during LTP_mode=1) kbps bit rate encoding modes, the received pitch index (adaptive codebook index) is used to find the integer and fractional parts of the pitch lag. The adaptive codebook v(n) is found by interpolating the past excitation u(n) (at the pitch delay) using the FIR filters. 3) Decoding of fixed codebook vector: the received codebook indices are used to extract the type of the codebook (pulse or Gaussian) and either the amplitudes and positions of the excitation pulses or the bases and signs of the Gaussian excitation. In either case, the reconstructed fixed codebook excitation is given as c(n). If the integer part of the pitch lag is less than the subframe size 40 and the chosen excitation is pulse type, the pitch sharpening is applied. This translates into modifying c(n) as c(n)=c(n)+.beta.c(n-T), where .beta. is the decoded pitch gain g.sub.p from the previous subframe bounded by [0.2, 1.0].

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw. Desc | Ima

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31. Document ID: US 6459425 B1

L1: Entry 31 of 59 File: USPT Oct 1, 2002

DOCUMENT-IDENTIFIER: US 6459425 B1
TITLE: System for automatic color calibration

Detailed Description Text (35):
Referring to FIG. 4C, device independent color coordinates XYZ are input signals to display 17. Rendering employs the inverse of the operations used for imagical 14. The inverse of the calibration matrix M is called A.sup.-1 (to emphasize that we are considering numerically different matrices for the two devices) and is used to convert the XYZ input signals to linear device signals R'.sub.lin, G'.sub.lin and B'.sub.lin. The linear device signals R'.sub.lin, G'.sub.lin and B'.sub.lin are postconditioned using the inverse of the compensation function LUTs which define the non-linear relationship between applied signal and luminous output of display 17, a function which is defined and adjusted in a separate, empirical step of calibration. The output from the LUTs are gamma corrected signals R.sup.1/y, G.sup.1/Y, and B.sup.1/y representing the input to display 17. Note that there is no necessary relationship between the matrices A-1 and M in FIGS. 4B and 4C. Further, since the LUTs of FIGS. 4B and 4C may be used with various types of transformations in system 100, they are preferably represented by a separate data structure, within the software architecture, which may be combined like building blocks with other structures, such as 3.times.3 matrix, or multidimensional interpolation table, to form more complex data structures.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Ima

32. Document ID: US 6449590 B1

L1: Entry 32 of 59 File: USPT Sep 10, 2002

DOCUMENT-IDENTIFIER: US 6449590 B1
TITLE: Speech encoder using warping in long term preprocessing

Detailed Description Text (291):
For rates 4.55, 5.8 and 6.65 (during PP_mode) kbps bit rate encoding modes, the received pitch index is used to interpolate the pitch lag across the entire subframe. The following three steps are repeated for each subframe: 1) Decoding of the gains: for bit rates of 4.55, 5.8, 6.65 and 8.0 kbps, the received index is used to find the quantized adaptive codebook gain, g.sub.p, from the 2-dimensional VQ table. The same index is used to get the fixed codebook gain correction factor .gamma. from the same quantization table. The quantized fixed codebook gain, g.sub.c, is obtained following these steps: the predicted energy is computed ##EQU78## the energy of the unscaled fixed codebook excitation is calculated as ##EQU79## and the predicted gain g.sub.c is obtained as g.sub.c =10.sup.(0.05(E(n)+E-E.sup..sub.i). The quantized fixed codebook gain is given as g.sub.c =.gamma.g.sub.c. For 11 kbps bit rate, the received adaptive codebook gain index is used to readily find the quantized adaptive gain, g.sub.p from the quantization table. The received fixed codebook gain index gives the fixed codebook gain correction factor .gamma.. The calculation of the quantized fixed codebook gain, g.sub.c follows the same steps as the other rates. 2) Decoding of adaptive codebook vector: for 8.0 ,11.0 and 6.65 (during LTP_mode=1) kbps bit rate encoding modes, the received pitch index (adaptive codebook index) is used to find the integer and fractional parts of the pitch lag. The adaptive codebook v(n) is found by interpolating the past excitation u(n) (at the pitch delay) using the FIR filters. 3) Decoding of fixed codebook vector: the received codebook indices are used to extract the type of the codebook (pulse or Gaussian) and either the amplitudes and positions of the excitation pulses or the bases and signs of the Gaussian excitation. In either case, the reconstructed fixed codebook excitation is given as c(n). If the integer part of the pitch lag is less than the subframe size 40 and the chosen excitation is pulse type, the pitch sharpening is applied. This translates into modifying c(n) as c(n)=c(n)+.beta.c(n-T), where 0 is the decoded pitch gain g.sub.p from the previous subframe bounded by [0.2,1.0].

☐ 33. Document ID: US 6346994 B1

L1: Entry 33 of 59 File: USPT Feb 12, 2002

DOCUMENT-IDENTIFIER: US 6346994 B1
TITLE: Image processing system and its smoothing method for correcting color fog and backlight of a digital image

Detailed Description Text (60):
The first table generating unit 153 generates a correction curve using the half tone parameter obtained by calculation, and stores it in the LUT storing buffer 160 (Step 1004). Similarly to the LUT 1300 as shown in FIG. 13, the LUT storing buffer 160 can store data as the combinations of input brightness Y and output brightness F (Y). When the half tone parameter is the .gamma. value, a .gamma. correction curve is generated and stored in the LUT storing buffer 160. When the half tone parameter is the spline control points, a correction curve is generated by performing spline interpolation using the control points and stored in the LUT storing buffer 160.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw. Desc | Ima

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☐ 34. Document ID: US 6336060 B1

L1: Entry 34 of 59 File: USPT Jan 1, 2002

DOCUMENT-IDENTIFIER: US 6336060 B1
TITLE: Arithmetic processing method and system in a wide velocity range flight velocity vector measurement system using a square truncated pyramid-shape five-hole pitot probe

Detailed Description Text (27):
At start, the switch is moved to the ON position, whereupon in step 1 (indicated in the drawing as "ST1") the necessary information in the ROM is read in to the RAM (i.e., work area) and the standby state is entered. The reason that stored information in the ROM is read out to the RAM that serves as the work area is so that arithmetic operations performed at each step can be performed speedily, as work within the work area, without having to retrieve the necessary information from the ROM each time. Once flight begins, pressure information detected by the five-hole probe in step 2 is loaded and converted by the pressure converter to an electric signal (i.e., a voltage value), a characteristic coefficient of said converter stored in the ROM being used to effect said conversion. Five items of pressure information (PH, Pb1, Pb2, Pb3, Pb4) are smoothed in step 3, the arithmetic processing of said smoothing being carried out according to a data smoothing equation read out from the ROM to the RAM. From said smoothed pressure data, in step 4 attack angle pressure coefficient C.alpha. is calculated with arithmetic equation 1; sideslip angle pressure coefficient C.beta., with arithmetic equation 2; angle to airflow pressure coefficient C.gamma., with arithmetic equation 3; and Mach pressure coefficient CM, with arithmetic equation 4, said arithmetic equations being originally stored in the ROM but having been read out to the RAM (work area) in step 1. Once each pressure coefficient is arrived at, Mach number M is determined in step 5 using the aforesaid lookup table. The lookup table of the present embodiment, as stated above, retrieves Mach number M data for each intersection of predetermined airflow angle .gamma. and predetermined Mach pressure coefficient CM, and so the lattice region comprises uneven,

diamond-shape rectangles rather than even rectangle shapes. When the specified angle to airflow pressure coefficient value C.gamma. and Mach pressure coefficient value CM correspond to an intersection on the table, then the corresponding Mach number has only to be read out directly. Generally, however, [CM and C.gamma.] will correspond to coordinate points in an aforesaid diamond-shape region, in which case Mach number M is calculated by performing bilinear interpolation from the Mach numbers of the four corners. The interpolation equation used at such time is stored in advance in memory means along with the lookup table. Next, in step 6, arithmetic operations with attack angle .alpha. and sideslip angle .beta. are performed. Said arithmetic operations are carried out by applying the data of attack angle pressure calibration coefficient "A.sub.ij " and sideslip angle pressure calibration coefficient "B.sub.ij " stored in matrix form, the Mach number value M determined earlier, attack angle pressure coefficient C.alpha., and sideslip angle pressure coefficient C.beta. into equations 5 and 6 also stored in memory. In advance of said arithmetic operations, first, a data table of angle pressure calibration coefficients "A.sub.ij " and "B.sub.ij " corresponding to the value of Mach number M is selected. Coefficient calculations employ equations up to fifth order concerning Mach number M; arithmetic equations 5 and 6, third-order equations concerning attack angle pressure coefficient C.alpha. and sideslip angle pressure coefficient C.beta.. However, said polynomial equation operations do not entail solving equations but rather are simple calculations wherein known values are substituted [into said equations], and so are not time-consuming and can be carried out immediately. The foregoing arithmetic processing yields a flight velocity vector (M, .alpha., and .beta.) with respect to probe axis.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Ima

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☐ 35. Document ID: US 6335734 B1

L1: Entry 35 of 59 File: USPT Jan 1, 2002

DOCUMENT-IDENTIFIER: US 6335734 B1

**** See image for Certificate of Correction ****

TITLE: Color converting method

Brief Summary Text (49):

In the linear interpolation calculating step, output colors at eight lattice points in the lattice space to which the interpolation point belongs are weighted by the linear conversion parameters corresponding to the position of the interpolation point in the unit lattice space and a mean of the weighted output colors is calculated as an output color at the interpolation point. In the linear interpolation calculating step, the invention is characterized in that when predetermined non-linear characteristics, for example, .gamma. characteristics are set into the output color by using a multi-dimensional conversion table in which an input color and an output color have been set in accordance with a linear relation, after a re-calculation for converting the input color at the interpolation point to a position based on the non-linear characteristics was performed, the output color at the re-calculated interpolation point is calculated by the linear interpolation calculation. As for the re-calculation at the interpolation point in the linear interpolation calculating step, the input color (Rc, Gc, Bc) at the interpolation point is divided by the maximum color value 255 and is converted into a position (Rn, Gn, Bn) in a data set normalized to, for example, 0 to 1, and after that, the conversion calculation of the non-linear characteristics is executed. An input color at the interpolation point according to the non-linear characteristics is re-calculated by multiplying the converted calculation value by the maximum color value 255, and an output color corresponding to the re-calculated input color at the interpolation point is calculated by the linear interpolation. By the re-calculation of the input color at the interpolation point according to the non-linear characteristics of the output color, the position of the interpolation point is corrected from a position on the interpolation straight line to a position on a curve which gives the non-linear characteristics of the

output color. Even if there are strong non-linear characteristics of the output color, an interpolation result having a small conversion error is obtained.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw. Desc | Ima

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☐ 36. Document ID: US 6185007 B1

L1: Entry 36 of 59 File: USPT Feb 6, 2001

DOCUMENT-IDENTIFIER: US 6185007 B1
TITLE: Image forming apparatus

Detailed Description Text (190):
Then, according to the obtained part of the input value n [i] and output value LD [i] (i=0, 1, . . . , 15), interpolation is executed using the spline function or a .gamma. calibration table stored in an ROM is selected (step 245).

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw. Desc | Ima

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☐ 37. Document ID: US 6160922 A

L1: Entry 37 of 59 File: USPT Dec 12, 2000

DOCUMENT-IDENTIFIER: US 6160922 A
TITLE: Image forming apparatus with color adjustment

Detailed Description Text (170):
In a step S35, a spline function is used for interpolation based on the above (n[i], LD [i]) (i=0, 1, . . . , 15), or a .gamma. correction table stored in the ROM is selected on the basis of the same.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw. Desc | Ima

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☐ 38. Document ID: US 6157735 A

L1: Entry 38 of 59 File: USPT Dec 5, 2000

DOCUMENT-IDENTIFIER: US 6157735 A
TITLE: System for distributing controlling color reproduction at multiple sites

Detailed Description Text (39):
Referring to FIG. 4C, device independent color coordinates XYZ are input signals to display 17. Rendering employs the inverse of the operations used for imagical 14. The inverse of the calibration matrix M is called A.sup.-1 (to emphasize that we are considering numerically different matrices for the two devices) and is used to convert the XYZ input signals to linear device signals R'.sub.lin, G'.sub.lin and B'.sub.lin. The linear device signals R'.sub.lin G'.sub.lin and B'.sub.lin are postconditioned using the

inverse of the compensation function LUTs which define the non-linear relationship between applied signal and luminous output of display 17, a function which is defined and adjusted in a separate, empirical step of calibration. The output from the LUTs are gamma corrected signals R.sup.1/.gamma., G.sup.1/.gamma., and B.sup.1/.gamma. representing the input to display 17. Note that there is no necessary relationship between the matrices A.sup.-1 and M in FIGS. 4B and 4C. Further, since the LUTs of FIGS. 4B and 4C may be used with various types of transformations in system 100, they are preferably represented by a separate data structure, within the software architecture, which may be combined like building blocks with other structures, such as 3.times.3 matrix, or multidimensional interpolation table, to form more complex data structures.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Ima

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☐ 39. Document ID: US 6097836 A

L1: Entry 39 of 59 File: USPT Aug 1, 2000

DOCUMENT-IDENTIFIER: US 6097836 A
TITLE: Image processing system and its smoothing method for correcting color fog and backlight of a digital image

Detailed Description Text (62):
The first table generating unit 153 generates a correction curve using the half tone parameter obtained by calculation, and stores it in the LUT storing buffer 160 (Step 1004). Similarly to the LUT 1300 as shown in FIG. 13, the LUT storing buffer 160 can store data as the combinations of input brightness Y and output brightness F (Y). When the half tone parameter is the .gamma. value, a .gamma. correction curve is generated and stored in the LUT storing buffer 160. When the half tone parameter is the spline control points, a correction curve is generated by performing spline interpolation using the control points and stored in the LUT storing buffer 160.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Ima

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☐ 40. Document ID: US 6055071 A

L1: Entry 40 of 59 File: USPT Apr 25, 2000

DOCUMENT-IDENTIFIER: US 6055071 A
TITLE: Image forming apparatus

Detailed Description Text (132):
Then, based on the obtained values [n[i], LD[i]] (i=0, 1, . . . , 15), interpolation is executed with a spline function, or the .gamma.-calibration table stored in the ROM 416 is selected (step 3005).

Detailed Description Text (196):
And according to the obtained (n[i], LD[i]) (i=0, 1, . . . , 15) interpolation is performed with a spline function or the like, or a .gamma.-calibration table in the ROM 416 is selected (step 3005).

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Ima

☐ 41. Document ID: US 6043909 A

L1: Entry 41 of 59 File: USPT Mar 28, 2000

DOCUMENT-IDENTIFIER: US 6043909 A
TITLE: System for distributing and controlling color reproduction at multiple sites

Detailed Description Text (38):
Referring to FIG. 4C, device independent color coordinates XYZ are input signals to display 17. Rendering employs the inverse of the operations used for imagical 14. The inverse of the calibration matrix M is called A.sup.-1 (to emphasize that we are considering numerically different matrices for the two devices) and is used to convert the XYZ input signals to linear device signals R'.sub.lin, G'.sub.lin and B'.sub.lin. The linear device signals R'.sub.lin, G'.sub.lin and B'.sub.lin are postconditioned using the inverse of the compensation function LUTs which define the non-linear relationship between applied signal and luminous output of display 17, a function which is defined and adjusted in a separate, empirical step of calibration. The output from the LUTs are gamma corrected signals R.sup.1/.gamma., G.sup.1/.gamma., and B.sup.1/.gamma. representing the input to display 17. Note that there is no necessary relationship between the matrices A.sup.-1 and M in FIGS. 4B and 4C. Further, since the LUTs of FIGS. 4B and 4C may be used with various types of transformations in system 100, they are preferably represented by a separate data structure, within the software architecture, which may be combined like building blocks with other structures, such as 3.times.3 matrix, or multidimensional interpolation table, to form more complex data structures.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Ima

☐ 42. Document ID: US 5999719 A

L1: Entry 42 of 59 File: USPT Dec 7, 1999

DOCUMENT-IDENTIFIER: US 5999719 A
TITLE: Ion implantation process simulation device realizing accurate interpolation of ion implantation profiles and simulation method therefor

Brief Summary Text (10):
In the following, description will be made of a conventional ion implantation process simulation method of obtaining an ion implantation profile for a prescribed dose by interpolation, with reference to a flow chart of FIG. 6. With reference to FIG. 6, first, from table data of ion implantation profiles for several dose values, extract moment parameters, projected range Rp, standard deviation .DELTA.Rp, skewness .gamma. and kurtosis .beta. in two normalized functions respectively representing the amorphous component and the channeling component (moment parameters of a Dual Pearson function), an amorphous component dose coefficient and a channeling component dose coefficient (Step 601). As a result, a Dual Pearson data table is prepared. Next, select parameters for doses at two points most neighboring to an arbitrary dose from the Dual Pearson data table (Step 602). Next, out of the selected parameters, linearly interpolate the dose-dependent amorphous component dose coefficient and channeling component dose efficient with respect to dose (Step 603).

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Ima

43. Document ID: US 5987167 A

L1: Entry 43 of 59 File: USPT Nov 16, 1999

DOCUMENT-IDENTIFIER: US 5987167 A
**** See image for Certificate of Correction ****
TITLE: Color image display method and apparatus

Detailed Description Text (5):
Subsequently, a color transformation system is selected on the basis of both the color characteristic data of the input image and the display device (step S3). In this case, (a) simple LUT (Look-Up Table) transformation for performing transformation processing with a one-dimensional table, (b) three-dimensional LUT transformation for performing transformation processing with a three-dimensional table and then interpolating data, and (c) mixed matrix transformation for performing gamma correction and matrix calculation, are used as color transformation systems. In a color transformation system selecting step (step S3), the optimum color transformation system is selected from the above color transformation systems in consideration of the color transformation precision and the processing speed from the characteristics of the input and output sides.

44. Document ID: US 5982947 A

L1: Entry 44 of 59 File: USPT Nov 9, 1999

DOCUMENT-IDENTIFIER: US 5982947 A
TITLE: Image forming apparatus with color adjustment

Detailed Description Text (63):
The third quadrant indicates the LD writing values; the abscissa indicates the output values of the scanner read a toner pattern formed on a recording medium by a preselected laser output LD. FIG. 16 shows the characteristic of the printer. When RBG .gamma. correction is not executed, the graph coincides with a[LD]. While the LD writing values of the actual pattern are sixteen points, i.e., 00H (background), 11H, 22H, EEH, FFH, the intervals between the above points are interpolated so as to complete a continuous graph. The fourth quadrant is representative of the YMCK conversion table LD[i] which is the target. Reference data A[i] is determined for a given input value i, and then an LD output providing the data A[i] is determined, as indicated by arrows.

Detailed Description Text (79):
In a step S35, a spline function is used for interpolation based on the above (n[i], LD [i]) (i=0, 1, . . . , 15), or a .gamma. correction table stored in the ROM is selected on the basis of the same.

Detailed Description Text (134):
The third quadrant indicates the laser writing values; the abscissa indicates the output values of the scanner read a toner pattern formed on a recording medium by a preselected laser output LD. FIG. 32 shows the characteristic of the printer. When RBG .gamma. correction is not executed, the graph coincides with aw[LD]. While the LD writing values of the actual pattern are sixteen points, i.e., 00H (background), 11H, 22H, . . . , eeH, ffH, the intervals between the above points are interpolated so as to complete a continuous graph. The fourth quadrant is representative of the YMCK conversion tables LD [i] which is the target. Reference data A[i] is determined for a given input value i, and

then an LD output providing the data A[i] is determined, as indicated by arrows. FIG. 32 shows the characteristic of the printer involving RBG .gamma. transform. While FIG. 32 is coincident with FIG. 33 as to the third quadrant, the former differs from the latter as to the second quadrant. Although the reference data of the first quadrant must be changed, the YMCK conversion tables LD[i] which are the final results are coincident both in FIG. 32 and FIG. 33.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw. Desc | Ima

45. Document ID: US 5920407 A

L1: Entry 45 of 59 File: USPT Jul 6, 1999

DOCUMENT-IDENTIFIER: US 5920407 A
TITLE: Method and apparatus for applying tonal correction to image data

Detailed Description Text (22):
The desired transfer functions (e.g., 70, 72, and 74) are stored in RAM 68 as corresponding look-up tables. In one preferred embodiment, each look-up table comprises a 7-bit by 12-bit look-up table which is then piecewise linearly interpolated to 12 by 12. The primary advantage associated with using a 7-bit by 12 bit look-up table, as opposed to a 12-bit by 12-bit look-up table, is that it requires considerably less memory. While a less precise look-up table, such as an 8-bit by 8-bit table, could be used, such lower precision tables introduce an objectionable "stair step" effect into the data conversion process, particularly for the "gamma correction" transfer functions which will commonly be used.

Detailed Description Text (23):
For example, referring now to FIG. 9, the desired red gamma correction function (i.e., tonemap) 70, represents a continuous, non-linear curve which expands or brightens dark or low intensity input data and compresses or darkens higher intensity input data. If the red gamma correction function 70 is mapped as an 8-bit by 8-bit tonemap, the result will be a plurality of individual data points. If an interpolation process is used in conjunction with the look-up table, the resulting function of the look-up table will approximate the curve 81 which connects the various individual data points. As is readily seen in FIG. 9, the 8-bit by 8-bit curve 81 is characterized by a plurality of "stair steps." The stair step effect becomes particularly pronounced as the curve 70 flattens, i.e., becomes more horizontal. This stair-step effect is the result of the relatively coarse 8-bit output resolution, as indicated by arrows 91.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw. Desc | Ima

46. Document ID: US 5917511 A

L1: Entry 46 of 59 File: USPT Jun 29, 1999

DOCUMENT-IDENTIFIER: US 5917511 A
TITLE: Printer with image output characteristics correcting function

Detailed Description Text (22):
First, the standard densities Y0 through Yn obtained by tone signals X0 through Xn are determined from the standard reproduction property of FIG. 3(B) where n>0. The tone signals X0 through Xn are arranged at a certain interval (for example, 32) from a minimum

tone signal (0) to a maximum tone signal (for example, 255). Next, the actual tone reproduction characteristic data of FIG. 3(A) now set in the .gamma. setting portion 26 are subjected to a linear interpolation method. This method calculates actual tone signals Z0-Zn which are capable of providing the standard densities Y0-Yn. These actual tone signals Z0-Zn are shown in FIG. 3(C). These actual tone signals Z0-Zn are stored as correction values in the .gamma. table memory 40 at addresses indicated by the address numbers Ad (0.ltoreq.Ad.ltoreq.n).

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw. Desc | Ima

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☑ 47. Document ID: US 5856876 A

L1: Entry 47 of 59 File: USPT Jan 5, 1999

DOCUMENT-IDENTIFIER: US 5856876 A
**** See image for Certificate of Correction ****
TITLE: Image processing apparatus and method with gradation characteristic adjustment

Detailed Description Text (185):
FIG. 51 is a flow chart showing an example of the gradation control using the reader unit in this embodiment. The same step numbers denote the same procedures as in the fifth embodiment shown in FIG. 39, and a detailed description thereof will be omitted. In step S202", the CPU 2214 reads the coordinate positions and luminance values of color patches, as shown in, e.g., FIG. 52, and converts the obtained luminance signals into density signals by the LOG conversion unit 2206. Subsequently, in step S203", the CPU 2214 creates a table for converting the obtained density values into standard values (i.e., values obtained when the patches are read by a standard CCD sensor) in units of color components (M, C, and Y). In step S204", the CPU 2214 saves this table information in the RAM 2215 and sets it as masking coefficients of the masking/UCR unit 2208 or a gamma table of the gamma correction unit 2209, thereby correcting density signals obtained upon execution of the subsequent adjustment of the gradation characteristics. Note that conversion data between adjacent ones of 8-gradation color patches for each color in FIG. 52 are obtained by 1st-order interpolation. Alternatively, when the number of color patches is increased, or higher-order (e.g., second- or third-order) interpolation is used, the luminance signals can be corrected with high precision.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw. Desc | Ima

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☑ 48. Document ID: US 5760409 A

L1: Entry 48 of 59 File: USPT Jun 2, 1998

DOCUMENT-IDENTIFIER: US 5760409 A
TITLE: Dose control for use in an ion implanter

Detailed Description Text (37):
The ion implanter dose controller 27 contains a compensation look-up table that is generated before an implant begins as the first input for calculating the compensated beam current. The compensation table has a table of percentage compensation values at various pressures in finite increments or intervals which is calculated based on (removing a given set of) a given set of gammas and K factors specified in the recipe to be implanted. By means of the table look-up technique (i.e. by finding a corresponding value at a given value of dependent variable by interpolation) the dose controller

calculates the compensated beam current using real time pressure readings, the second input, much faster than requiring calculation on a real time basis of the entire equation. The corrected beam current as an output signal to drive the up and down scan (y scan) to achieve a proper dose control.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Ima

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☐ 49. Document ID: US 5662552 A

L1: Entry 49 of 59 File: USPT Sep 2, 1997

DOCUMENT-IDENTIFIER: US 5662552 A
TITLE: Lock-up clutch slip control device

Detailed Description Text (26):
As shown in FIG. 7, in step S301, .alpha. (rpm) (shown in the shaded section in FIG. 8B) is added to the target slip amount (rpm) corresponding to the target value of J (shown in the shaded section in FIG. 8A of the operating ranges of the table having the parameters of throttle aperture change rate .DELTA.TA (%/sec) and turbine rotational speed NT (rpm) as shown in FIG. 8A. .beta. (rpm) is added to the values of operating ranges adjacent to the operating range used as the standard value. Then, .gamma. (rpm) is added to the values of operating ranges adjacent to those ranges so that the target slip amount is updated relative to all operating ranges in the map as shown in FIG. 8B, thus ending the sub-routine. However, regarding addition to the target slip amounts (rpm) representing normal operating ranges where the throttle aperture change rate .DELTA.TA=0 shown by A to D is inhibited. Furthermore, the updating amount becomes smaller so the operating range moves further from the operating range that is standard. The updating amount in such a case is .alpha.>.beta.>.gamma.. Furthermore, the value .alpha. added to the target slip amount is determined by the difference (.DELTA.TA-.DELTA.TAO) between the throttle aperture change rate .DELTA.TA and the designated value .DELTA.TAO. The values .beta. and .gamma. are determined according to .alpha.. In other words, .alpha.=f.sub.0 (.DELTA.TA-.DELTA.TAO), .beta.=f.sub.1 (.alpha.) and .gamma.=f.sub.2 (.alpha.). Suitable results are obtained when the functions f.sub.0, f.sub.1 and f.sub.2 are simply fractional coefficients; e.g., f.sub.0 (x)=0.9x, f.sub.1 (x)=2x/3 or f.sub.2 (x)=x/3. Also, the target slip amounts of the adjacent operating ranges in the maps in FIG. 8A and FIG. 8B are determined by interpolation.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Ima

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☐ 50. Document ID: US 5512961 A

L1: Entry 50 of 59 File: USPT Apr 30, 1996

DOCUMENT-IDENTIFIER: US 5512961 A
TITLE: Method and system of achieving accurate white point setting of a CRT display

Detailed Description Text (10):
The second step of the factory calibration process is to generate a gamma table 29, which maps the relationship between the cathode 35 voltages and the beam currents 32 for each of the three primary color beams. The beam currents 32 are often exponential with respect to their driving voltages. This non-linearity manifests itself as an exponential relationship, the exponent often being known as the CRT gun's "gamma". During the calibration process, beam currents are measured for various values of video signals 28

from CPU 26. These values are stored in gamma table 29 so that beam currents 32 can be predicted as a function of digital video level. The number of such measured values is not critical, and depends largely on the degree of non-linearity exhibited by the guns being measured. Generally, a sufficient number of gamma points should be measured to allow for reasonably accurate interpolation. The gamma table and normalized tristimulus values for each gun are used for recalibration of the display 36 with reference to FIG. 3, below.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Ima

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Term	Documents
GAMMA$3	0
GAMMA	247791
GAMMAA	17
GAMMAABU	2
GAMMAALA	1
GAMMAAND	76
GAMMAANP	1
GAMMAAO	1
GAMMAATP	16
GAMMAB	23
GAMMABAR	1
(GAMMA$3 SAME TABLE$3 SAME (INTERVAL$3 OR STEP$3) SAME INTERPOLAT$5).PGPB,USPT,EPAB,JPAB,DWPI,TDBD.	59

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☐ 51. Document ID: US 5471282 A

Using default format because multiple data bases are involved.

L1: Entry 51 of 59 File: USPT Nov 28, 1995

US-PAT-NO: 5471282
DOCUMENT-IDENTIFIER: US 5471282 A

TITLE: Deposited toner quantity measuring method and image forming apparatus using the same

DATE-ISSUED: November 28, 1995

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Hayashi; Koji	Yokohama			JP
Bisaiji; Takashi	Yokohama			JP

US-CL-CURRENT: 399/64; 356/445, 399/55

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw. Desc | Ima

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☐ 52. Document ID: US 5021667 A

L1: Entry 52 of 59 File: USPT Jun 4, 1991

DOCUMENT-IDENTIFIER: US 5021667 A
TITLE: Movable calibration collimator and system and method using same

Detailed Description Text (13):
After the camera-imaged centers are correlated with known locations, one or more correction tables are generated, step 162. One such technique for this procedure described by S. E. King, F. J. Ih, C. B. Lim, R. Chaney, and E. Gray in "Spectral-Spatial-Sensitivity Distortion Trends and an Accurate Correction Method in Scintillation Gamma Cameras," IEEE Transactions on Nuclear Science, Vol. NS-32, February 1985. Preferably, interpolation and extrapolation are utilized to obtain very fine increments of linearity corrections. Correction tables generated by a method according to this invention, however, are more accurate than those generated by conventional methods because the camera images contain far more images than those possible using a fixed grid. As described above, this is possible because the spacing between holes must be far enough so that it can be determined where each detected event originated without confusing its origin with other possible locations. In other words, a calibration system and method using a calibration collimator according to this invention provide exposures which are much denser than the hole patterns themselves. Further, these dense position images are acquired by moving the collimator in a single direction; movement in two directions is not required.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Ima

☑ 53. Document ID: US 4689759 A

L1: Entry 53 of 59 File: USPT Aug 25, 1987

DOCUMENT-IDENTIFIER: US 4689759 A
TITLE: Process and installation for the analysis and retrieval of a sampling and interpolation signal

Detailed Description Text (37):
Each step corresponds to the application of a routine whose flow chart is given in FIG. 7. The first interpolation step (phase 20) uses the coefficient vector H.sub.5. A test is applied. The progamme continues if the value of K originally displayed is greater than 1. The table of samples obtained after the first interpolation step is substituted for the original samples (FIGS. 22). The routine .gamma. is again applied (phase 24) and the program continues until the number of interpolation provided for at the outset has been effected, each of the interpolations from the third one being effected with the same coefficient vector H.sub.2 and corresponding to the sequence 26.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Ima

☐ 54. Document ID: US 4619079 A

L1: Entry 54 of 59 File: USPT Oct 28, 1986

DOCUMENT-IDENTIFIER: US 4619079 A
**** See image for Certificate of Correction ****
TITLE: Grinding machine for ball end mills with helical cutter teeth

Detailed Description Text (11):
FIG. 6 shows in plan portions of the mechanisms 3, 9 and the bottom of the turntable 2, which are arranged on the X-direction slide table 10. A chain 250 is trained around a sprocket wheel 249 mounted on the bottom of the turntable 2, these members constituting a drive interval introducing device. The proportional guideway 301 is supported for being freely turned and fixed in a horizontal plane, by a support shaft of the pivot base 306 mounted on the Y-direction slide table 8 for being adjustably slidable in the Y direction by a handle 307 for interpolating the separate notch holes in the gear 209 fitted over the spindle 201. The pivot base 306 has a pointer movable with the proportional guideway 301 and a scale movable by a handle 307' to indicate the radius r of the spherical cutter. The scale and the pointer as they intersect provide a reading of tan .gamma.. A Y-direction guideway 303 is fixedly mounted on the X-direction slide table, and a slider 304 is fitted in the Y-direction guideway 303 for sliding movement in the Y direction. The slider 304 has an extension serving as a connecting rod 302 having an end serving as a junction pin fitted in a slider 301' slidably fitted in the proportional guideway 301. The chain 250 extending from the turntable 2 is trained around idling sprocket wheels 929, 928 of a mechanism (described later) for introducing tan .gamma..multidot.ln (1+L tan t/R)/sin t, and idling sprocket wheels 305 of the Y-direction guideway 303, and is secured to opposite ends of the slider 304. Such an arrangement is similar to a conventional attachment, which however is of a sixed construction in which the stroke of the slider 304 is transmitted directly to the spindle. For grinding conical helical cutter teeth with the known arrangement, therefore, the X-direction slider 10 should be

of a double structure, and the spindle mounted on an attachment secured to an upper portion and the X-direction slider should be inclined with respect to the X-axis while sliding the X-direction slider 10. With the present invention, a slider 927 is fixed, and the spindle 201 can be driven through the chain 250 directly by the stroke of the slider 304 and the slider 301', that is, the stroke of the X-direction slide table 10. Since the proportional guideway 301 is rectilinear, the spindle 201 can be rotated in proportion to the inclination of the proportional guideway 301 and the stroke of the X-direction slide table 10. The spindle 201 can grind helical cutter teeth with a constant lead on the cylindrical or conical surface at a grinding point. The double differential gear device and the known proportional guideway allow in combination an entire ball end mill having plain helical cutter teeth with a constant lead to be ground by one-chucking process. Since conical helical cutter teeth with a constant lead have different helix angles dependent on the position thereon, the grinding wheel mechanism 4 is required to be tilted according to such varying helix angles.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Ima

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☐ 55. Document ID: US 4492474 A

L1: Entry 55 of 59 File: USPT Jan 8, 1985

DOCUMENT-IDENTIFIER: US 4492474 A
TITLE: Method and apparatus for ascertaining color balance of photographic printing paper

Brief Summary Text (14):
Those skilled in the art will have little difficulty in realizing that color printing papers of different classes, such as positive to positive and negative to positive papers, are designed to have degrees of contrast which particularly suit them for printing from the appropriate original, as the case may be. Therefore, from one lot of paper to another of the same brand, paper will have the same gamma (contrast) within small limits of variation. Such being the case, tables of exposure correction may be constructed for each brand of printing paper which would allow the user to find the correct amount of log exposure correction for overall density based upon the value, interpolated or direct, of the density of the matching step(s) of the paper gray scale.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Ima

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☐ 56. Document ID: US 4468123 A

L1: Entry 56 of 59 File: USPT Aug 28, 1984

DOCUMENT-IDENTIFIER: US 4468123 A
TITLE: Method and apparatus for ascertaining color balance of photographic printing paper

Detailed Description Text (19):
Those skilled in the art will have little difficulty in realizing that color printing papers of different classes, such as positive to positive and negative to positive papers, are designed to have degrees of contrast which particularly suit them for printing from the appropriate transparencies or negatives, as the case may be. Therefore, from one lot to another, the same brand or kind of paper will have the same gamma (contrast) within small limits of variation. Such being the case, tables of exposure correction may be constructed for each kind of color printing paper which would allow the user to find the correct amount of log exposure correction for overall density based upon

the value, interpolated or direct, of the density of the matching step(s) of the paper gray scale.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Ima

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57. Document ID: US 4275444 A

L1: Entry 57 of 59 File: USPT Jun 23, 1981

DOCUMENT-IDENTIFIER: US 4275444 A
**** See image for Certificate of Correction ****
TITLE: Arrangements for constructing representations of parts of bodies

Detailed Description Text (12):
FIG. 4 shows a radiation fan of angle .alpha. disposed about a centre line 19. As in FIG. 3 the modified and interpolated signals can be considered to be for beam paths disposed at equal spacing along arc RGQWS. As mentioned before, in one arrangement this arc can represent a line of detectors on an arc centred on an x-ray source at 18. It is desired to back project the interpolated signals into storage locations corresponding to matrix elements 12, of which three rows are shown. It is proposed to first project the signals onto a line AGHPB, parallel to the matrix rows, and tangential to RGQWS, bearing in mind that the actual procedure involves operating on electrical signals in simulation of the geometrical procedures described. The line AGHPB is at a distance Y from the fan focus or virtual focus 18 and the angle .theta. of a beam is defined from the line from focus 18 to point G. Also defined is the angle .gamma. which is the angle between the centreline of a beam and the centreline (bisector) 19 of the fan angle .alpha.. With these definitions, back projection is exactly as explained in relation to FIG. 3, with each successive step along the interpolated value locations on RGHQS requiring access to arctan lookup tables, as GQ=arctan (X/Y). Two further conditions are imposed, however. The first is that all of the interpolated signals for beam paths on RGHQS are projected on to AGHPB along corresponding radii originating at 18, not merely those passing through one row of matrix elements. The second condition is that the loctions to which they are projected are equally spaced along AGHPB although the equiangular lines of projection are not so equally spaced.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Ima

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58. Document ID: EP 1107090 A1

L1: Entry 58 of 59 File: EPAB Jun 13, 2001

DOCUMENT-IDENTIFIER: EP 1107090 A1
TITLE: First order interpolation with input value interval detection

Abstract Text (1):
CHG DATE=20010704 STATUS=O> A device supplies an output value Y in response to an input value X in accordance with a given function F. The function F can be, for example, a gamma correction function for a video signal. The device operates as follows. An input section (INP) derives a table input value (XT) and an interpolator input value (XI) from the input value (X). A table (TBL) supplies a table value (YT) in response to the table input value (XT). An interpolator (INT) supplies an interpolation value (YI) in response to the interpolator input value (YI). An output section (OUT) combines the table value (YT) and the interpolation value (YI) so as to obtain the output value (Y). The input

section (INP) comprises an interval detector (DET) which defines a plurality of input value intervals (I1, I2). This detector (DET) supplies an interval indication (IND) which indicates the interval (I1) in which the input value (X) lies. The input section (INP) further comprises an input value former (IVC) for forming the table input value (XT) and the interpolator input value (XI) in dependence on the interval indication (IND). The table input value (XT) and the interpolator input value (XI) are determined, respectively, by a more significant part (MSP) of the input value and the complementary less significant part (LSP) of variable magnitudes in accordance with the interval indication (IND). By means of such a device a satisfactory accuracy of the output value can be obtained while the table is of a moderate size.

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59. Document ID: NA9206328

L1: Entry 59 of 59 File: TDBD Jun 1, 1992

DOCUMENT-IDENTIFIER: NA9206328
TITLE: Gamma Curve Determination/Checking without Visual Equipment.

Disclosure Text (1):
- Disclosed is a method of visually matching known patterns to ascertain the gamma characteristic of display devices without using special equipment. It ensures an accurate intensity on any display device with at least six bits input to the digital/analog (D/A) converters. - Novel is the use of the eye to compare intensities generated by a mixture of two known intensities and one pure unknown intermediate intensity. The resulting visual comparison verifies that a given intensity has an expected value (gamma correction). It also enables by iteration an input look-up table value that gives the required output intensity (to establish gamma correction). - Three sets of values are involved: image ({im}), intermediate ({in}) and output ({out}). The image values are those stored in the image. The intermediate values are the result of applying a lookup table to the image values. The output values are the intensities radiated by screen. Thus: in = lookup (im) and out = gam (in). The aim is to perform the following without the use of a lightmeter. * Determine the gamma mapping {gam}; * Create a gamma correction lookup table {lookup} that is the inverse of {gam}; out = gam(lookup(in)) = in * Verify whether a given lookup table {lookup} gives a reasonable correction for the gamma of a given device. - Assumed, except where otherwise stated, that all three sets of values are in the range {0-1}. The values actually used during programming will typically have to be in the range {0-255}. The notation {1/2 = = 128} is used to show values in both ranges. - All the tests described operate on the same principle. Where two intermediate values {in1} and {in2}, produce, when used on large areas of the display intensities {out1=gam (in1)} and {out2=gam(in2)}, respectively. Then an area of screen display using a mix with proportion {p1} of {in1} pixels, and {1-p1} of {in2} pixels will produce an average intensity {out3} out3 = p1*out1 + (1-p1)*out2 Also when the mixed area is viewed from a distance next to a smooth area of pixels with intermediate value {in3}, where {out3=gam (in3)}, there will be no noticeable boundary. - Where the proportion {p} is a simple value such as {1/2}, a mixed area of {in1} and {in2} values may be produced with a simple pattern such as a chessboard called here a {fine} chessboard. Where less rational values of {p} are used, a suitable mixed area may be generated using error diffusion. This principle does not always hold, but gives good results if used with care. - The principle makes the assumption that a fine chessboard of pixels with intensities {y} and {0} will have an average intensity of {y/2}. Where the fine chessboard consists of very small squares, such as one pixel by one pixel, this is not true for most devices. This may be seen by comparing fine chessboards of the same overall size, but with different small square sizes. - The effect is not always in the same direction, sometimes the very fine chessboards are too bright, sometimes too dark. Possibilities are that the dots overlap significantly and interact in some non-linear manner, or that the D/A converters and

analog output drivers cannot cope with such high frequency signals. - On all devices tested by this method, there was no significant difference between the outputs from fine chessboards using 3*3 small squares and those using larger small squares. Mostly, 2*2 small squares are adequate. If the small squares are too large, a very high viewing distance is needed to prevent the small squares themselves being visible. The standard testcard uses fine chessboard areas of height 2. The width is varied across the testcard, with widths of 1, 2, 4 and 8. - The method relies on various testcards generated on the principle above. Four are shown at the end of this article. Testcards 1 and 2 are divided into large squares. Smooth squares are shown with a single intended {output} value (intensity). Mixed squares are shown by giving an intended average intensity, and the values from which that intensity is to be mixed. Testcards 3 and 4 use smoothly changing intensities. - The chessboard tests are an economical way of checking whether a particular gamma correction is accurate. The chessboard image consists of several stripes. Each stripe compares output intensities for a smooth area of image value {x/2} and a fine chessboard of image values {x} and {0}. This is done by displaying a coarse chessboard with 'white' squares having all values {x/2}, and the 'black' squares having a fine chessboard of values {x} and {0}. - Testcard 1 uses a 16-by-16 coarse chessboard, with 8 stripes of two coarse chessboard stripes each. The first stripe uses values {1/2==128} against a mix of {1==255} and {0}. The next stripe uses values {1/4==64} against a mix of {1/2==128} and {0}, and so on until the final stripe uses values {1/128==2} against a mix of {1/256==1} and {0}. These give an overview of gamma correction throughout the range, using approximately visually even spread. An alternative, using a spread based on the CIE cube law for visually even spread could also be used. When this pattern is viewed from very close, the fine chessboards are easily visible. As the viewer moves away, the fine chessboards appear to turn into areas of constant intensity gam(lookup(x))/2 + gam(lookup(0))/2. If proper gamma correction is applied, this is equal to the intensity gam(lookup(x/2)) of the smooth coarse squares in the same stripe. Thus, when the testcard is displayed properly gamma corrected, and viewed from a distance, the stripes are very clearly seen, but the coarse chessboard cannot be seen. - The gamma procedure requires an explicit model of the gamma characteristics of the device, and a program GAMMA that generates a lookup table to implement the inverse function. The user experimentally chooses gamma curve parameters until the best compromise of invisible coarse chessboards is found. A simple gamma curve of the eye, gam(in) = in ** gamma, does not adequately model most devices, as there is no detectible output for low input values. A better approximation formula is: gam(in) = 0 where in <= min = ((in - min) / (1 - min)) ** gamma where in >= min. The gamma test thus requires a program GAMMA that takes two inputs, gamma and min, and produces as output a lookup table that applies the inverse gamma map: in = im**(1/gamma) * (1 - min) + min Values {gamma=1}, {min=0} show the result of not applying any gamma correction. - A multivalue generation procedure produces a set of values that can be interpolated to create a full lookup table. {Lookup(1)} is set to {1}, and {lookup(0) to {0}. The user then interacts in several steps. Modify lookup(1/2) until the top stripe appears uniform; modify lookup(1/4) until the second stripe appears uniform, and so on until the entire picture is uniform. The multi-value generation procedure relies on the value for {x/2} in one stripe being the same as the value for {x} in the stripe below. This requires the testcard using values {1}, {1/2}, {1/4}, and so on. - A lookup table test is used to verify that a given lookup table is adequate. The testcard is displayed with the given lookup table, and the user verifies that the stripes on the output are sufficiently regular. This test is especially useful where one terminal has been calibrated, and another similar terminal is to be used. It is also useful to check that nobody has tampered with the knobs on a terminal since it was calibrated.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw. Desc

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Term	Documents
GAMMA$3	0

GAMMA	247791
GAMMAA	17
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GAMMAAO	1
GAMMAATP	16
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